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# ECHINODERMA

COMPILED BY

A. M. CLARK, M.A.

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# 5. ECHINODERMA

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## CONTENTS

	PAGE
I. TITLES ... ..	1
II. SUBJECT INDEX ... ..	11
III. SYSTEMATIC INDEX ... ..	14

### I.—TITLES.

**Direction 72.** Completion and in certain cases correction of entries relating to the names of genera of the Phyla Mollusca, Brachiopoda, Echinodermata and Chordata made on the *Official List of Generic Names in Zoology* by Rulings given in *Opinions* rendered in the period up to the end of 1936. Opin. int. Comm. zool. Nom. **1E** : 161–192.

**Direction 73.** Addition to the *Official List of Specific Names in Zoology* (a) of the specific names of twenty-five species of the Phyla Mollusca, Brachiopoda, Echinodermata and Chordata, each of which is the type species of a genus, the name of which was placed on the *Official List of Generic Names in Zoology* in the period up to the end of 1936 and (b) of the specific names of three species belonging respectively to the Phyla Brachiopoda, Echinodermata and Chordata, each of which is currently treated by some or all specialists as a senior subjective synonym of the name of such a species. Opin. int. Comm. zool. Nom. **1E** : 193–214.

**Afzelius, B. A. (1).** Basophilic structures in the cytoplasm of the sea urchin egg. Proc. Stockh. Conf. on Electron Microscopy 1956 : 147–149 1 fig.

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**Ancellin, J.** Observations sur la faune et les fonds de pêche de quelques secteurs de la manche et des mers nordiques. *Rev. Trav. Inst. Pêches marit.*, **21** : 449-484 7 figs.

**Anderson, J. M.** *see* Guthrie, M. J.

**Arvy, L.** Contribution à la connaissance des "corps bruns" des Holothuridae. *C.R. Acad. Sci. Paris* **245** : 2543-2545.

**Bäckström, S.** Content and distribution of ascorbic acid in sea urchin embryos of different developmental trends. *Exp. Cell Res.* **13** : 333-340 7 figs.

**Balinsky, J. B.** The Ophiuroidea of Inhaca Island. *Ann. Natal Mus.* **14** : 1-33 4 pls., 7 figs. map.

**Banhidi, Z. G.** An attempt to separate large amounts of sea urchin blastulae developed from embryonal fragments. *Ark. Zool.* **10** : 449-452 1 fig.

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**Bernasconi, I. (2).** Otra nueva especie de Asteroideo brasileño. *Neotropica* **3** (11) : 33-34 1 fig.

**Bernhard, M.** Die Kultur von Seeigellarven (*Arbacia lixula* L.) in künstlichem und natürlichem Meerwasser mit Hilfe von Ionenaustauschsubstanzen und Komplexbildnern. *Pubbl. Staz. zool. Napoli* **29** : 80-95 1 fig, 1 pl.

**Blacker, R. W.** Benthic animals as indicators of hydrographic conditions and climatic change in Svalbard waters. *Fish. Invest. Min. Agric. London* (2) **20** (10) : 1-49 30 figs.

**Blaschko, H. & Hope, D. B.** Observations on and distribution of amine oxidase in invertebrates. *Arch. Biochem. & Biophys.* **69** : 10-15.

**Bolst, A. L. & Whiteley, A. H.** Studies of the metabolism of phosphorus in the development of the sea urchin, *Strongylocentrotus purpuratus*. *Biol. Bull. Woods Hole*, **112** : 276-287 2 figs.

**Boroughs, H.** *see* Hsiao, S. C.

**Brookbank, J. W.** *see* Tyler, A.

**Cailleux, A.** *see* Chavan, A.

**Caso, M. E. (1).** El genero *Clypeaster* Lamarck 1801, en el Terciario de Mexico. Resúmenes de los Trabajos Presentados XX Congreso Geológico Internacional, Mexico 1956 : 112.

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**Jose, K. V.** *see* Gideon, P. W.

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**Kaiser, K.** *see* Druckrey, H.

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## II.—SUBJECT INDEX

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**Taxonomy.**—Direction 72; Direction 73; of echinoids, Durham & Melville (1) & (2); of *Dendraster*, Raup; dates of some *Pentremites* spp., Sinclair; of *Rotula*, Tortonese (1).

**Collections.**—Oceanographic Institute of San Pablo University, Bernasconi (1).

### STRUCTURE

**Symmetry.**—Asymmetry in fossil *Echinolampas*, Roman; double forms of echinoids, Ubisch (3); tetramerous *Anseropoda*, Zavodnik.

**Skeletal anatomy.**—*Pentremites*, Galloway & Kaska; echinoids, Kier (1); interambulacral plate atrophy in fossil *Lovenia*, Philip; *Scyphocrinus* with its lobolith root or *Camarocrinus*, Yakovlev (4).

**Internal anatomy.**—Cuvierian tubules of *Holothuria*, Endean (1); retraction of starfish stomach, Basch; of Scutellids, Stevenson; food canal in *Holothuria*, Stott.

**Microstructure.**—Plates of carpod *Paranacystis*, Caster & Eaton; Cuvierian tubules of *Holothuria*, Endean; Vitelline body in *Arbacia* eggs, Millonig; Cell membranes, Mitchison; microstructure of developing eggs, Runnström (2).

### PHYSIOLOGY

**Musculature.**—Contraction of fibres retracting starfish stomach, Basch.

**Reaction to light.**—Sensitivity, Millott (2); spectral sensitivity, Millott & Yoshida; positive phototaxis in *Psammechinus*, Yoshida.

**Respiration.**—Measurements in early development, Holter & Zeuthen; in Spermatozoa, Mohri (2).

**Relation to water.**—Quality of seawaters estimated by echinoid development, Bernhard; variations in *Asterias* according to salinity, Schlieper; ion regulation in brackish water forms, Seck.

**Pigments.**—Carotenoid in *Peronella*, Kawaguti & Yamasu; Naphthaquinone pigment in *Diadema*, Millott (1); Echinochrome A, Nishibori; carotenoids in starfish integument, Vevers & Millott.

**Bio-chemistry.**—Carbonates in relation to skeleton, Revelle and Fairbridge in Hedgpeth, chapter 10; lipids of pyloric cecum of *Asterias*, Karnovsky, Jeffrey, Thompson & Deane; systematic serology of four asteroids, Kubo; Naphthaquinone pigment in *Diadema*, Millott (1).

## REPRODUCTION AND SEX

**Reproductive cycles.**—Giese et al.

**Spermatogenesis.**—In *Asterina*, Cognetti.

**Hermaphroditism.**—In *Echinaster sepositus*, Delavault & Cognetti.

## DEVELOPMENT

**Embryology.**—Gametes studied by electron microscopy, Afzelius; dynamics of early development, Holter & Zeuthen; Cleavage mechanism, Mitchison; development of *Hemicentrotus*, Okada & Miyauchi; mitosis and cell division, Swann.

**Fertilization including experimental studies.**—Acrosomal reaction, Afzelius (2); partial fertilization induced by oestradiol, Agrell (2); Spermatogenesis and fertilization in *Asterina*, Cognetti; acrosome reaction, Dan; polyspermy, Hagström; fertilization of jelly-free echinoid eggs, Hagström & Markman; cytochemical studies of fertilization, Immers; aldolase at fertilization, Ishihara; fertilization-promoting factor in egg water, Lybing & Hagström; interaction between sperm and jelly-coat, Monroy (1); swelling properties of egg mitochondria before and after fertilization, Monroy (2); Colleterin in toughening of fertilization membrane, Motomura; analysis of egg surface structures using antibodies, Perlmann (1) & (2), Perlmann & Perlmann (1) & (2); surface folding of unfertilized egg and increased membrane capacitance after fertilization, Rothschild (1); Rothschild (2); cell surface in relation to fertilization, Runnström (1); effects of porphyrexid and porphyrindin on fertilization, Runnström (3); role of surface layers of eggs in fertilization, Runnström (4); solidifying effect on egg surface of porphyrindin and trypsin, Runnström & Kriszat.

**Chemical embryology.**—Basophilic structures in egg cytoplasm, Afzelius (1); ascorbic acid occurrence in embryos, Bäckström; occurrence of amine oxidase, Blaschko & Hope; phosphorus metabolism in development, Bolst & Whiteley; alkaline phosphatase in hydrid echinoid embryos, Flickinger; acid-soluble nucleotides in early development, Hultin (1); metabolic utilization of C<sup>14</sup>-formate in embryos, Hultin (2); polysaccharides in mitotic figures, Immers; phospholipid in spermatozoa, Kinoshita, Mohri (2); glucose oxidation traced by radioactive CO<sub>2</sub>, Krahle; cytochrome oxidase distribution in echinoid larva, Mancuso; thymine in the acid-soluble fraction of *Arbacia* eggs, Marshak & Marshak; perivisceral fluid of *Arbacia* eggs, Messina; fatty acid oxidation in spermatozoa, Mohri (1); effect of malonate on O<sub>2</sub> uptake and dehydrogenase activity of spermatozoa, Mohri (3); ATP-ases of mitochondria, Ricotta.

**Experimental embryology.**—Effects of temperature changes on cellular division, Agrell (1); mass separation of developing blastula fragments, Banhidi; 'vitellogenous band' of oocyte, Cotronei & Urbani; inhibitors of cell division in unfertilized echinoid eggs, Druckrey, Schmähl & Kaiser; effect of toluidine blue on starfish egg, Fautrez & Fautrez-Firlefyn; effects of amino acids, Gustafson & Hörstadius; determination of bilateral symmetry in eggs, Hörstadius (1); regulation of bilateral symmetry in split and fused 32-cell eggs, Hörstadius (2); uptake of Ca<sup>45</sup> by echinoid eggs, Hsiao & Boroughs; changes in protein specificity, Ishida & Yasumasu; effect on cleavage of demecolcin, Kobayashi & Nakamura (1) & (2); effect of DNP, Kriszat & Runnström; effect of different physiological conditions on nuclear size, Kupka; animalization by certain polysulphonic derivatives, Lallier (1); effect of perchlorate on determination, Lallier (2); animalization by sodium polyanethol sulphonate, Lallier (3); effects of three dyes on determination, Lallier (4), of sulphhydryl substances, Lallier (5), and of sulphonic derivatives on determination, Lallier (6); nuclear activity in differentiation, Markman; protoplasmic contractility and gel



structure, **Marsland**; morphogenetic effects of treatment of eggs with trypsin, **Moore** (2); Infraciliature in *Paracentrotus* larvae, **Mugard**; incorporation of radioactive isotopes into echinoid eggs, **Nakano & Monroy**; effect of urea on development, **Pedrazzi**; analysis of egg surface structures using antibodies, **Perlmann** (1) & (2) and **Perlmann & Perlmann** (1) & (2); cortical inhibitions and polyspermy in antiserum-treated eggs, **Perlmann & Hagström**; effects of cobaltous chloride with sodium chloride and zinc chloride on development of sand-dollar larva, **Rulon**; effect on structure of animal and vegetal factors in echinoid development, **Runnström** (2); antisera blocking cell division, **Tyler & Brookbank** (1) & (2); abnormal and hybrid larvae, **Ubisch** (1) & (2); cytostatic effect of antipyretics on egg development, **Wilhelmi**.

**Techniques.**—Electron microscopy in studying gametes, **Aizelius** (3) & (4) and for *Arbacia* eggs, **Millonig**; phase contrast microscopy for observing development, **Holter & Zeuthen**.

## EVOLUTION AND GENETICS

**Phylogeny.**—Of groups of *Pentremites*, **Galloway & Kaska**.

**Speciation.**—**Sarà**.

**Hybridization.**—Biparental inheritance in interordinal echinoid crossing, **Moore** (1); Hybrid larvae, **Ubisch** (2).

**Variation.**—In *Echinocyamus*, **Kier** (4), in *Dendraster*, **Raup**, in *Leptasterias polaris*, **Tortonese** (2).

## ECOLOGY AND HABITS

**General works.**—**Hedgpeth et al.**

**Paleoecology.**—Martinsburg shale, Pennsylvania, U.S., **Cramer**; of *Pentremites*, **Galloway & Kaska**; general, **Ladd et al.**; of *Saccocoma*, **Patrulus**.

**Occurrence.**—**Beche de mer**, **S.V.O.S.**

**Communities.**—Of fishery grounds in Channel and North Sea, **Ancellin**; fluctuations in populations of *Asterias*, **Coe**; Zonation, **Collignon**; bottom communities, **Thorson** in **Hedgpeth**; starfishes in Ligurian Sea, **Tortonese** (4).

**Effects of environment.**—Distribution of larvae around Kiel, **Banse**; optimum temperature for *Asterias* development, **Sagara & Sugawara**; salinity differences and *Asterias*, **Schlieper**.

**Feeding.**—Of *Evasterias*, **Christensen**, of *Psammechinus* in aquaria, **Hancock**.

**Parasites.**—Umagillidae (Turbellarians) forming 'brown bodies' in *Holothuria*, **Arvy**.

**Commensals.**—Some known examples, **Dales** in **Hedgpeth**.

**Aquaria.**—*Psammechinus*, **Hancock**.

## DISTRIBUTION

### GEOGRAPHICAL

**Arctic.**—Bering Sea, **Baranova**; Spitzbergen, **Blacker**; Alaska, **Durham**.

**North Atlantic.**—English Channel and North Sea, **Ancellin**; Pembrokehire, Wales, **Bassindale & Barrett**; North Carolina, U.S., **Cooke** (2); Portugal, *Astropecten*, **Cumano**; Maine, U.S., **Frings & Frings**; Germany, **Gruner** in **Stresemann**; SW. England, **Marine Biological Association**.

**Mediterranean.**—**Cherbonnier** (1); Algeria, **Dieuzeide & Roland**; **Gautier-Michaz**; Israel, **Tortonese** (3); Ligurian Sea, *Asteroids*, **Tortonese** (4).

**Tropical Atlantic.**—Sierra Leone, **Cherbonnier**, (3); Congo, **Collignon**; Bahama holothurians, **Deichmann**; Tropical West Africa, **Madsen** (3).

**Indo-West Pacific.**—Portuguese E. Africa, **Balinsky**; N. China, **Chang & Woo**; **Djakonov**; Guam, *Holothurians*, **Domantay**; Queensland, Australia, **Endean** (2); Gulf of Cutch, India, **Gideon**, **Menon**, **Rao & Jose**; Japan, *Asteroids*, **Hayashi** (1) & (2).

**East Pacific.**—Clipperton Island, **Hertlein & Emerson**; S. America, especially Chile, **Madsen** (1); *Heliaster*, **Schneider**.

**South Temperate and Subantarctic.**—South-east Africa, **Balinsky**; east S. America, **Bernasconi** (1); Brazil, *Asteroid*, **Bernasconi** (2); Patagonia, **Madsen** (1); Brazil, **Tommasi**.

## GEOLOGICAL

**General.**—Maryland, U.S., Vokes (1).

**Pleistocene.**—Mexico, *Clypeaster*, Caso (1) & (2); Maastricht, Engel in Burck; Holothurians, Frizzell & Exline; Gulf of California, Hertlein; Mariana Is., Johnson; British Somaliland, Kier (4); S. Australia, Reynolds.

**Pliocene.**—Mexico, *Clypeaster*, Caso (1) & (2); Alaska, Durham; Maastricht, Engel in Burck; holothurians, Frizzell & Exline; Gulf of California, Hertlein; Morocco, Echinoids, Petitot (3); S. Australia, Reynolds.

**Miocene.**—Mexico, *Clypeaster*, Caso (1) & (2); Mariana Is., Cooke (1), Johnson; Central America and U.S., Durham; holothurians, Frizzell & Exline; Germany, Jörg; British Somaliland, Kier (4); Italy, Mirigliano; Japan, Morishita (1) & (2); Morocco, Echinoids, Petitot (3); *Astrodapsis*, Stevenson; Maryland, U.S., Vokes (2); Portugal, Zbyszewski.

**Oligocene.**—Mexico, *Clypeaster*, Caso (1) & (2); Oregon, U.S., Durham; holothurians, Frizzell & Exline; Italy, Mirigliano; Japan, Morishita (1); Rasmussen; S. Australia, Reynolds; Turkmen, U.S.S.R., Vialov.

**Eocene.**—Spain, Bataller; holothurians, Frizzell & Exline; Mariana Is., Johnson; British Somaliland, Kier (4); Morocco, Echinoids, Petitot (3); S. Australia, Reynolds; France, Roman; Turkmen, U.S.S.R., Vialov.

**Cretaceous.**—Azerbaijan, U.S.S.R., Aliev; Spain, Bataller; E. Greenland, Donovan; Maastricht, Engel & Meijer; holothurians, Frizzell & Exline; Egypt, Jux; *Uintacrinus*, Miller, Sternberg & Walker; Japan, Morishita (1); Morocco, Echinoids, Petitot (3); Crinoids, Rasmussen; Nigeria and Cameroons, Reymont; Germany, Struve; Slovakia, Szörényi.

**Jurassic.**—Algeria, Devriès; E. Greenland, Donovan; holothurians, Frizzell & Exline; Dorset, England, holothurians, Hampton; Dorset, Hodson, Harris & Lawson; Pomerania, Kongiel; Roumania, Patruilus; Morocco, Petitot (1) & (3); Algeria, Petitot (2); Somers, England, Sylvester-Bradley & Hodson.

**Triassic.**—Germany, Heller; Morocco, Echinoids, Petitot (3); Slovakia, Szörényi.

**Permian.**—Cromyocrinidae, Yakovlev (6).

**Carboniferous.**—Kentucky, U.S., Conkin; Nevada, U.S., Durham; U.S.S.R. echinoids, Faas; N. America, *Pentremites*, Galloway & Kaska; Ireland, echinoid, Kier (2); Texas, U.S., Kier (3); Arizona, U.S., holothurians, Langenheim & Epis; Morocco, echinoids, Petitot (3); Yorkshire, Ramsbottom; Oklahoma, U.S., Strimple; Oklahoma and New Mexico, U.S., Strimple & Koenig; U.S.S.R. blastoids, Yakovlev (1); Cromyocrinidae, Yakovlev (6).

**Devonian.**—Brazil, Caster & Eaton; U.S.S.R., Eltushcheva; Rhineland, Germany, Falke; E. France, Firtion; Victoria, Australia, Carpoids, Gill & Caster; Germany, Grabert & Grabert; Germany, Asterozoa, Lehmann; Bashkir, U.S.S.R., Crinoids, Postnikova, Liashenko & Efremova; Germany, Sieverts-Doreck (1); Alberta, Canada, Stearn; U.S.S.R., Yakovlev (2) & (3).

**Silurian.**—U.S.S.R., Eltushcheva; Victoria, Australia, Carpoids, Gill & Caster; U.S.S.R., Yakovlev (3) & (4).

**Ordovician.**—Oklahoma, Amsden; Morocco, Choubert & Pernier; Pennsylvania, U.S., Asterozoa, Cramer; U.S.S.R., Eltushcheva, Ghekker & Ghekker; Maryland, U.S., Sando; Argentina, Sieverts-Doreck (2); Estonia, Yakovlev (5).

**Cambrian.**—Walcott's 'Holothurians', Madsen (2); Vermont, U.S., Shaw; Argentina, Sieverts-Doreck (2).

## III.—SYSTEMATIC INDEX

## HOLOTHURIOIDEA

†*Achistrum cordatum* sp. nov. Jurassic Dorset, England, Hampton p. 509 fig. 9, *A.* cf. *bathonianum* figs. 3, 4, *A. gamma* fig. 5, *monochordata* fig. 6, *A.* sp. ind. figs. 1, 2, *Id.*; *A. gamma* p. 340 figs. 12, 13 *monochordata* pp. 340–341 figs. 10, 11, spp. nov. Jurassic Dorset, England, Hodson, Harris & Lawson, *A.*



cf. *issleri* p. 340 figs. 8, 9, *Id.*; *A. frizzelli* sp. nov. Carboniferous Arizona, U.S., **Langenheim & Epis** pp. 167-170 pl. i figs. 1-6.

*Actinopyga agassizii*, **Deichmann** pp. 6-7 figs. 5-13; *A. mauritiana*, **Domantay** pp. 349-350.

*Capheira mollis*, **Baranova** p. 239.

*Chiridota discolor*, *pellucida*, p. 245, **Baranova**.

†*Chiridotitesidae*, **nom. nov.** for family *Theeliidae* **Frizzell & Exline**, invalidated, **Defandre-Rigaud** p. 354.

*Cladodactyla* pp. 25-27, with *C. crocea* pp. 27-29 figs. 10-13, *senegalensis* pp. 29-31 figs. 14-19, **Panning**.

†*Croneisites* **gen. nov.** pp. 113-114, family *Synaptitidae*, for type *Synapta oligocaenica* **Spandel, Frizzell & Exline**; *C. laevigatus*, *oligocaenicus* p. 114, *Id.*

*Cucumaria abyssorum* pp. 241-242, *calicigera* p. 241, *californica* p. 242, *chronchjelmi* p. 240, *falax* p. 242, *glacialis* p. 240, *ijimai* p. 242, *japonica* p. 240, *lamperti* p. 242, *pusilla* p. 241, *vegae* p. 241, **Baranova**; *C. chronchjelmi*, **Chang & Woo** (in Chinese) pp. 137-139 fig. 9 pl. ii figs. 3-4; *C. adela* p. 36, *frauenfeldi* pp. 36-37, *posthuma* p. 36, *sancti-johannis* p. 37, **Panning**.

†*Eldonia ludwigi*, **Madsen** (2) p. 281, a coelenterate.

*Elpidia glacialis*, **Baranova** p. 236.

†*Etheridgella* sp., **Hampton** p. 510 figs. 11, 12.

*Euapta lappa*, **Deichmann** p. 17; *E. godeffroyi*, **Domantay** p. 353.

*Hemioedema* pp. 32-34, with *H. spectabilis* pp. 34-35 figs. 20-22, **Panning**.

*Holothuria* **Linnaeus** 1758, suppressed, **Direction 72** p. 169; *H. tremula* **Linnaeus** 1767 placed on the Official List of Specific Names in Zoology, **Direction 73** pp. 198, 208; *H. floridana* figs. 39-53, *glaberrima* p. 12, *grisea* pp. 11-12, *impatiens* pp. 7-8 figs. 14, 15, *mexicana* pp. 9-11 figs. 21-38, *parvula* p. 12-13, *princeps* p. 8 figs. 16-20, **Deichmann**; *H. arenicola* pp. 346-347, *argus* pp. 338-339, *atra* pp. 339-340, *cinerascens* pp. 340-341, *curiosa* var. *pervicax* pp. 341-342, *edulis* pp. 342-343, *gyrifer* pp. 343-344, *impatiens* pp. 344-346, *pulla* pp. 347-348, *rugosa* p. 348, *sanctori*

pp. 348-349, **Domantay**; *H. leucospilota*, **Hertlein & Emerson** pp. 6-7; *H. grisea*, **Tommasi** pp. 40-41 figs. 28, 30 d, e pl. iv fig. 1.

†*Laggania cambria*, **Madsen** (2) p. 281 a polychaete.

*Leptosynapta ooplax*, **Chang & Woo** pp. 141-143 fig. 11; *L. inhaerens*, **Gruner in Stresemann** p. 460 fig. 460/1.

†*Louisella pedunculata*, **Madsen** (2) p. 281, a polychaete.

†*Mackenzia costalis*, **Madsen** (2) p. 281, a coelenterate.

*Myriotrochus rinkii*, **Baranova** pp. 245-246.

*Opheodesoma spectabilis*, **Domantay** p. 354.

*Paelopatides solea*, **Baranova** pp. 238-239 fig. 19.

*Pannychia moseleyi virgulifera*, **Baranova** pp. 235-236.

*Parathyone* **gen. nov.**, family *Cucumariidae*, for type *Thyone surinamensis* **Semper, Deichmann** p. 16; *P. surinamensis* p. 16.

*Pentacucumis* **gen. nov.**, family *Cucumariidae*, for type *Cladodactyla plancki* **Brandt, Deichmann** p. 13; *P. plancki* pp. 13-16 figs. 54-71, *Id.*

*Phyllophorus glaucus*, **Baranova** p. 243; *P. ordinatus*, **Chang & Woo** pp. 139-140 fig. 10 pl. ii fig. 5.

†*Portalia mira*, **Madsen** (2) p. 281, a sponge.

*Pseudostichopus aleutianus* p. 239, *nudus* p. 240, *trachus* p. 239, **Baranova**.

*Psolidiella*, **Panning** p. 35.

*Psolidum bullatum*, **Baranova** p. 245.

*Psolus chitonoides* pp. 244-245, *fabrii* p. 244, *peronii* p. 244, *regalis* p. 243, **Baranova**

†*Redoubtia polypodia*, **Madsen** (2) p. 281, a polychaete.

†*Rhabdotites bifidus* p. 342 figs. 16, 22, *divergens* p. 342 figs. 14, 17, 18, *dorsetensis* p. 341 figs. 5, 15, 20, 21, *irregularis* p. 343 fig. 25, *tridens* p. 343 fig. 19, **spp. nov.** Jurassic Dorset, England, **Hodson, Harris & Lawson**; *R.?* *rectus*, **Hampton** p. 510 fig. 10.

†*Rigaudites* gen. nov. pp. 101–102, family Synaptitidae, for type *Synaptites cuvillieri* Deflandre-Rigaud, Frizzell & Exline; *R. bastropanus* pp. 103–104 fig. 5 Eocene Texas, U.S., *plummerae* pp. 106–107 fig. 3 Cretaceous Texas, *spinosus* pp. 107–108 fig. 4 Cretaceous Texas, *tallaili* pp. 108–110 fig. 6 Cretaceous Texas spp. nov., *R.* sp. nov. Cretaceous Texas pp. 110–111, *cuvillieri* pp. 105–106 figs. 1, 2, Id.

†*Rota* gen. nov. p. 170, family Theelidae, for type *R. martini* sp. nov. Carboniferous Arizona, U.S. p. 170 pl. i figs. 17–25, Langenheim & Epis.

*Scotoplanes murrayi*, Baranova p. 237.

†*Spandelites* gen. nov. p. 101, family Synaptitidae, for type *Synaptites? irregularis* Deflandre-Rigaud, Frizzell & Exline.

*Sphaerothuria bitentaculata*, Baranova pp. 242–243.

*Stichopus japonicus* v. *armatus*, Baranova p. 237; *S. badionotus*, Deichmann pp. 4–5 figs. 1–4; *S. badionatus* pp. 350–351, *chlaronotus* pp. 351–352, *horrens* p. 352, Domantay; *S. badionotus*, Tommasi pp. 41–42 fig. 30a pl. iv figs. 3, 4.

*Synallactes nozawai*, Baranova p. 237.

*Synapta maculata*, Domantay pp. 353–354.

†*Synaptites* emended pp. 110–111, with *S. circularis* pp. 111–112, *eocoenus*, *renifer* p. 112, *stueri* pp. 112–113 truncated p. 113, Frizzell & Exline.

*Synaptula hydriformis*, Tommasi pp. 39–40 fig. 30 b, c pl. iv fig. 2.

†*Theelia* Schlumberger invalidated, and a synonym of *Chiridotites* Deflandre-Rigaud, Deflandre-Rigaud, pp. 353–354; *T. wessexensis* sp. nov. Jurassic Dorset, England, Hodson, Harris & Lawson pp. 338–339 figs. 1–3, 5–7, 17 *T. convexa* fig. 4, Id.

†Theeliidae Frizzell & Exline invalidated, replaced by Chiridotitidae, Deflandre-Rigaud.

†*Thuroholia* with *T. marginata* sp. nov. Carboniferous Arizona, U.S., Langenheim & Epis p. 167 pl. i figs. 7–16.

*Thyonacta sabanillaensis*, Cherbonnier (2) pp. 537–540 figs. 1, 2.

*Thyone fusus*, Gruner in Stresemann p. 460 fig. 459 3; *T. briareus*, Guthrie & Anderson p. 503 figs. 16.12, 16.13.

*Thyonidium pellucidum*, Baranova p. 243.

## ECHINOIDEA

†*Abertella kewi* Miocene Mexico pp. 627–628 fig. 2 pl. lxxii figs. 1, 7, *palmeri?* Miocene Guatemala pp. 626–627 pl. lxxii figs. 4, 9, 10, spp. nov., Durham; *A. aberti*, Vokes (2) p. 39 pl. xxx figs. 4, 5.

†*Acanthocidaris* sp., Cooke (1) p. 362 pl. cxix fig. 8.

†*Acrosalenia angularis*, Kongiel p. 60 pl. i figs. 1–3.

*Aëropsis fulva*, Baranova pp. 232–234 fig. 18.

†*Albertechninus* gen. nov. pp. 741–744, family Lepidocentridae, for type *A. montanus* sp. nov. Devonian Alberta, Canada pp. 744–746 fig. 1 pl. lxxxi figs. 1–3, Stearn.

†*Ambipleurus rotundatus* sp. nov. Eocene British Somaliland Kier (4) p. 847 fig. 1e–g pl. ciii fig. 9; *A. douvillei* pp. 847–848 fig. 1c, d pl. ciii fig. 10, Id.

†*Amphiope bioculata*, Chavan & Cailleux p. 199 fig. 2245.

*Aporocidaris fragilis*, Baranova pp. 209–210.

*Arbacia lixula*, Bernasconi (1) pp. 55–56 pl. i figs. 3, 4 pl. iv fig. 3; *A. lixula* var. *africana*, Collignon pl. ii fig. 3B; *A. punctulata*, Guthrie & Anderson fig. 16.9 A, B; *A. lixula*, Tommasi pp. 23–25 figs. 8–11 pl. i fig. 1.

*Arbacioida*, Durham & Melville (2) p. 255, diagnosed.

†*Arcaechninus* gen. nov. p. 891, family Brissidae for type *A. auraduensis* sp. nov. Eocene British Somaliland pp. 891–893 fig. 18 pl. cvii figs. 6–8, Kier (4).

†*Archaeocidaris* sp., Faas p. 75 pl. x fig. 10.

†*Astrodapsis* pp. 340–343 with *A. cuyamanus* fig. 1E, *peltoides* pl. xlv fig. 6, *woodringi* pl. xlv fig. 7, Stevenson.

*Atelostomata*, Durham & Melville (2) p. 259, diagnosed.

†*Bonaireaster ruttleri*, Durham & Melville (2) figs. 3, 4.



†*Bothriocidaris*, Durham & Melville (2) p. 242.

†*Bothriocidaroida*, Durham & Melville (2) p. 249, diagnosed.

†*Brightonia* gen. nov. pp. 871–872, family Stenonasteridae, for type *B. macfadanyi* sp. nov. Paleocene British Somaliland pp. 872–873 fig. 13 pl. civ figs. 12, 13, Kier (4).

*Brisaster latifrons* p. 235, townsendi pp. 234–235, Baranova.

*Brissopsis lyrifera*, Gruner in Stresemann p. 459 fig. 459/2, Madsen (3) p. 479.

†*Brissopsis makiyamai* sp. nov. Miocene Japan, Morishita (2) pp. 161–163 pl. i figs. 1–5; *B.* sp. cf. *raulini*, Kier (4) p. 899 pl. cvii figs. 16, 17.

Cassiduloida, Durham & Melville (2) p. 260, diagnosed.

*Centrostephanus besnardi*, Bernasconi (1) pp. 56–59 text figs. 1–9 pl. i figs. 2, 6, pl. vii fig. 2a–c; *C. longispinus*, Millott (2) fig. 4.

*Cidaris cidaris nuda*, Madsen (3) pp. 479–481.

†*Cidaris coronata*, Chavan & Cailleux p. 193 fig. 2220; *C. dorsata*, Szörényi pp. 130–131.

Cidaroida, Durham & Melville (2) p. 251, diagnosed.

*Clypeaster speciosus*, Stevenson fig. 1 A, B pl. xlv figs. 4, 5.

*Clypeaster (Stolonoclypeus) subdepressus*, Tommasi pp. 30–31 figs. 22–24 pl. ii figs. 3, 4.

†*Clypeaster saipanicus* sp. nov. Miocene Mariana Is., Pacific, Cooke (1) p. 362 pl. cxix figs. 14–17; *C. chiapasensis* pp. 502–505 figs. 4, 5, *C. aff. chiapasensis* pp. 519–521 fig. 17, *C. crustulum* pp. 513–516 figs. 12, 13, *marinanus* pp. 508–509, *meridanensis* pp. 511–513 fig. 11, *oxybaphon* pp. 505–508 figs. 7, 8, *puleus* pp. 516–519 figs. 14–16, *speciosus* pp. 521–524 fig. 18, *staubi* pp. 499–502 figs. 1–3, *topilanus* pp. 509–511 figs. 9, 10, Caso (2); *C. aegyptiacus*, Chavan & Cailleux p. 200 fig. 2249.

Clypeasterina, Durham & Melville (2) p. 259, diagnosed.

Clypeasteroida, Durham & Melville (2) p. 259 diagnosed.

VOL. 94.

†*Clypeus ploti*, Chavan & Cailleux p. 202 fig. 2256.

†*Codiopsis doma*, Chavan & Cailleux p. 197 fig. 2235.

†*Collyrites ellipticus*, Chavan & Cailleux p. 203 fig. 2263.

†*Collyropsis moussoni*, Szörényi pp. 131–133.

Conoclypina, Durham & Melville (2) p. 256, diagnosed.

†*Conoclypus aequidilatatus*, Durham & Melville (2) fig. 5; *C.* p. 858 with *C. delanoue* pp. 858–859 Kier (4).

*Dendraster* (recent and fossil) with *D. excentricus*, Raup pp. 685–694; *D. excentricus*, Stevenson fig. 1 C, D pl. xlv figs. 2, 3.

*Diadema antillarum*, Millott (2) figs. 1–3, 13, 15.

Diadematacea, Durham & Melville (2) pp. 252–253, diagnosed.

Diadematoidea, Durham & Melville (2) p. 253, diagnosed.

†*Discoidea karakaschi*, Aliev p. 1171 fig. 3; *D.* sp.? *rotula*, Szörényi p. 131.

†*Discoides cylindricus*, Chavan & Cailleux p. 197 fig. 2236.

†*Donbassechinus* gen. nov. p. 73, family Palaeochinidae, for type *D. kumpani* sp. nov. Carboniferous Don basin, U.S.S.R., pp. 73–74 figs. 6–8 pl. x figs. 6–8, Faas.

Echinacea, Durham & Melville (2) p. 253, diagnosed.

†*Echinanthus vidali*, Bataller p. 30 pl. v figs. 3–6.

*Echinarachnius asiaticus* pp. 228–229 fig. 16, *parma* pp. 225–228 fig. 15, Baranova; *E. parma*, Durham pp. 629–630 pl. lxxii fig. 5.

†*Echinarachnius alaskensis* sp. nov. Pliocene Alaska, Durham pp. 628–629 pl. lxxii figs. 6, 8.

*Echinocardium cordatum*, Chang & Woo pp. 135–137 fig. 8 pl. i figs. 3–5, Gruner in Stresemann p. 459 fig. 459/1, Kier (1) p. 971 fig. 1.

†*Echinocardium orthonotum*, Vokes (2) p. 39 pl. xxx figs. 1–3.

†*Echinocorys ovatus*, Chavan & Cailleux p. 204 fig. 2264.

†*Echinocyamus* p. 859 with *E. polymorpha* pp. 859–870 figs. 7–12 pl. civ figs. 5–8, Kier (4).

†*Echinocystitoida*, Durham & Melville (2) p. 249, diagnosed.

†*Echinodiscus chikuzenensis*, Morishita (1) p. 194.

Echinoida, Durham & Melville (2) p. 255, diagnosed.

†*Echinolampas vidali*, Bataller p. 31 pl. v figs. 7–9; *E. calvimontanum*, Chavan & Cailleux p. 203 fig. 2262; *E. sp. Cooke* (1) p. 364 pl. cxix figs. 22, 23; *E. p. 848* with *E. fraasi* pp. 848–855 figs. 2–5 pl. ciii figs. 11, 12 pl. civ fig. 1, Kier (4); *E. stelliferus*, Roman fig. 1.

*Echinometra lucunter*, Bernasconi (1) pp. 62–63 pl. ii figs. 1, 5, Tommasi pp. 29–30 figs. 16, 20 pl. i figs. 4, 6.

Echinoneina, Durham & Melville (2) p. 256, diagnosed.

†*Echinostrephus saipanicum* sp. nov. Miocene Mariana Is., Cooke (1) p. 362 pl. cxix figs. 4–6.

Echinothurioida, Durham & Melville (2) p. 253, diagnosed.

*Echinus acutus mediterraneus*, Madsen (3) p. 481.

*Encope emarginata*, Bernasconi (1) pp. 64–65 pl. iii figs. 1, 2, Tommasi p. 34 pl. iii figs. 1, 2; *E. californica*, Stevenson fig. 1F pl. xlv fig. 1.

†*Epiaster* ? sp., Reyment pp. 45–46 pl. vi fig. 3a, b.

*Eucidaris tribuloides*, Bernasconi (1) pp. 52–54 pl. i figs. 1, 5, Collignon pl. ii figs. 3A, 4.

Euechinoidea, Durham & Melville (2) p. 252, diagnosed.

†*Eupatagus nipponicus* sp. nov. Miocene Japan, Morishita (2) pp. 163–164 pl. i figs. 7, 8; *E. ornatus*, Chavan & Cailleux p. 206 fig. 2274; *Eupatagus* p. 896 with *E. cairensis* pp. 896–897 pl. cvii fig. 9, *dainellii* pp. 897–898 pl. cvii figs. 10–13, *fecundus* p. 898 pl. cvii figs. 14, 15, *E. sp. cf. cordiformis* p. 898, Kier (4).

†*Eupholidocidaris* gen. nov. p. 15 family Lepidocentridae, for type *E. brightoni* sp. nov. Carboniferous Ireland, pp. 16–17 figs. 1, 2 pl. i, Kier (2); *E. belli* sp. nov. Carboniferous Texas, Kier (3) pp. 326–328 fig. 1.

†*Fibularia dubarensis* sp. nov. Miocene British Somaliland Kier (4) pp. 870–871 fig. 7c–e pl. civ figs. 9–11.

†*Glypticus hieroglyphicus*, Chavan & Cailleux p. 196 fig. 2233.

*Glyptocidaris crenularis*, Chang & Woo pp. 128–130 figs. 1–3 pl. i fig. 1 pl. ii fig. 1.

Gnathostomata, Durham & Melville (2) p. 255, diagnosed.

†*Haimea ovumserpentis*, Durham & Melville (2) fig. 2.

†*Hemiaster bufo*, Chavan & Cailleux p. 205 fig. 2269.

†*Hemiaster (Trachyaster)* with *H. (Trachyaster)* sp. Kier (4) p. 880.

†*Hemicidaris crenularis*, Chavan & Cailleux p. 193 fig. 2222.

†*Hemicidaris (Hemicidaris) crenularis* var. *alta* var. nov. Jurassic Pomerania, Kongiel pp. 62–63 pl. ii figs. 5–6; *H. crenularis* pp. 61–62 pl. ii figs. 2–4.

Hemicidaroida, Durham & Melville (2) p. 254, diagnosed.

†*Heteraster oblongus*, Chavan & Cailleux p. 205 fig. 2270.

†*Heterocentrotus* sp., Cooke (1) p. 362 pl. cxix fig. 7; *H. mammillatus*, Kier (4) p. 848.

†*Holaster subglobosus*, Chavan & Cailleux p. 204 fig. 2266; *H. laevis*, Szörényi p. 133.

Holasteroida order nov. for families Collyritidae, Disasteridae, Holasteridae, Urechinidae, Calymnidae, Pourtalesidae and Stenonasteridae, Durham & Melville (2) pp. 260–261.

Holactypina, Durham & Melville (2) p. 256, diagnosed.

Holactypoida, Durham & Melville (2) p. 256, diagnosed.

†*Holactypus depressus*, Chavan & Cailleux p. 197 fig. 2237, Durham & Melville (2) fig. 1A, B; *H. corallinus*, Kongiel p. 72 pl. vi figs. 3–6.

†*Hypodiadema hoffmanni*, Kongiel p. 63 pl. iii figs. 1–3.

†*Infraclypeus thalebensis*, Devriès pp. 149–157 figs. 1–9.

†*Kewia* sp. indet., Oligocene Oregon, U.S., Durham p. 630 pl. lxxii fig. 3.

Laganina, Durham & Melville (2) p. 259, diagnosed.



- †*Leiocidaris thiebaudi*, **Teixeira** p. 83.
- †*Leviechinus* **gen. nov.** pp. 873–874, family *Stenonasteridae*, for type *Pericostmus gregoryi* **Currie**, **Kier** (4); *L. gregoryi* pp. 874–875 fig. 14 pl. civ figs. 14–16, **Id.**
- †*Linthia somaliensis*, **Kier** (1) pp. 971–974 fig. 3; *Linthia* p. 886 with *L. cavernosa* pp. 888–890 fig. 17 pl. cvi figs. 17–19, *somaliensis* pp. 886–888 fig. 16 pl. cvi figs. 15, 16, **Kier** (4); *L. praenipponica*, **Morishita** (1) pp. 196–197 pl. ii figs. 2a–d; *L. sudanensis*, **Reyment** pp. 47–48 pl. vii figs. 4, 5a, 5b, 6a, 6b.
- Loriolella* with *L. ludovicii*, **Petitot** (2) pp. 87–91 pl. i.
- †*Lovenechinus* sp. cf. *septies*, **Durham** pp. 625–626.
- †*Lovenia woodsi*, **Philip** pp. 402–407 figs. 1, 2.
- †*Lutetiaster* p. 890 with *L. maccagnoii* pp. 890–891, **Kier** (4).
- †*Lychnidius scrobiculatus*, **Engel & Meijer** pp. 88–93 figs. 1–3 pl.
- Lytechinus variegatus*, **Bernasconi** (1) pp. 60–61 pl. ii figs. 2, 6, **Millott** (2) figs. 5, 6, 16–21, **Tommasi** pp. 25–26 figs. 12–15 pl. i figs. 2, 5.
- Megalopoda*, **Durham & Melville** (2) p. 262, diagnosed.
- Mellita quinquiesperforata latiambulacra*, **Bernasconi** (1) pp. 63–64 pl. iv figs. 5, 6; *M. longefissa*, **Stevenson** fig. 1G; *M. quinquiesperforata*, **Tommasi** pp. 31–32 fig. 3 pl. ii figs. 1, 2 pl. iii figs. 3, 4.
- †*Melonechinus* (?) *heckeri* sp. nov. Carboniferous Leningrad Province, U.S.S.R., **Faas** pp. 74–75 fig. 9 pl. x fig. 9.
- Meoma cadenati* sp. nov. Senegal, **Madsen** (3) pp. 474–479 figs. 1–3.
- †*Merriamaster* sp., **Stevenson** fig. 1H.
- Metalia costae*, **Gauthier-Michaz** p. 82.
- †*Micraster coranguinum*, **Chavan & Cailleux** p. 206 fig. 2271, **Kier** (1) p. 971 fig. 2.
- †*Micropedina olisiponensis*, **Reyment** pp. 46–47 fig. 1a–d pl. vii figs. 1a–c.
- †*Migliorinia* p. 893 with *M. migiurtina* pp. 893–896 figs. 19, 20 pl. cvii figs. 1–5, **Kier** (4).
- Miocidaridae*, **nom. nov.** for *Streptocidarinae* **Lambert**, unacceptable, **Durham & Melville** (2) p. 252.
- Moiria atropos*, **Bernasconi** (1) pp. 65–67 pl. iv figs. 1, 2.
- †*Myriastiches*, **Durham & Melville** (2) p. 243.
- Neolampas rostellata*, **Gautier-Michaz** p. 81.
- †*Nucleolites scutatus*, **Chavan & Cailleux** p. 202 fig. 2257.
- Nucleolitoida*, **Durham & Melville** (2) p. 260, diagnosed.
- †*Nudobrissus* sp. indet., **Morishita** (1) p. 200 pl. iv fig. 2.
- †*Opissaster* pp. 875–876 with *O. auraduensis* sp. nov. Paleocene British Somaliland pp. 876–877 fig. 15a pl. cv figs. 3–5, *O. derasmoi* var. *angulatus* var. nov. Eocene British Somaliland pp. 879–880 pl. cv figs. 7–9, **Kier** (4); *O. derasmoi* pp. 878–879 fig. 15b pl. cv fig. 6 *farquharsoni* p. 876, *somaliensis* pp. 877–878 **Id.**
- †*Orthopsis pomeraniae* sp. nov. Jurassic Pomerania, **Kongiel** pp. 70–72 pl. v figs. 5, 6; *O. granularis*, **Durham & Melville** (2) fig. 1C.
- †*Palaechinoida*, **Durham & Melville** (2) p. 251, diagnosed.
- †*Palechinus*, **Chavan & Cailleux** pp. 192–193 fig. 2219.
- †*Palmeraster japonicus* sp. nov. Oligocene Japan, **Morishita** (1) pp. 194–195 pl. ii figs. 1a–c.
- Paracentrotus gaimardi*, **Tommasi** pp. 26–29 fig. 19 pl. i fig. 3.
- †*Parasalenia marianae* sp. nov. Miocene Mariana Is., Pacific, **Cooke** (1) pp. 361–362 pl. cxix figs. 1–3.
- †*Paraster saipanicus* sp. nov. Miocene Mariana Is., Pacific, **Cooke** (1) pp. 363–364 pl. cxix figs. 18–21.
- †*Pedinopsis* ? *melo* sp. nov. Eocene British Somaliland, **Kier** (4) p. 845 fig. 1a, b pl. ciii figs. 4, 5.
- †*Pericosmus* cf. *spatangioides*, **Morishita** (1) pp. 195–196 pl. i figs. 2–3.
- †*Perischocidaris hartiana*, **Ramsbottom** p. 106 fig.
- Perischoechinoidea*, **Durham & Melville** (2) p. 249, diagnosed

*Peronella japonica*, Kawaguti & Yamasu figs. 1-3.

†*Pharaonaster* with *P. sp. cf. ammon* Kier (4) p. 875 pl. civ fig. 17 pl. cv figs. 1, 2.

†*Phymosoma koenigi*, Chavan & Cailleux p. 195 fig. 2227a-c, *P. supra-coralinum*, Kongiel pp. 67-68 pl. iv figs. 4-6.

*Phymosomatoida*, Durham & Melville (2) p. 254, diagnosed.

*Plagiobrissus costae*, Madsen (3) p. 479, Tortonese (3) p. 192.

†*Plesiaster peini*, Morishita (1) pp. 199-200 pl. i fig. 1 pl. iv fig. 3.

†*Plesiolumpas* p. 855 with *P. auralduensis* pp. 857-858 pl. civ figs. 2-4, *currae* pp. 856-857 fig. 6 pl. ciii figs. 13, 14, *spp. nov.* Paleocene British Somaliland, Kier (4); *P. saharae*, Reymont p. 47 fig. 1e pl. vii figs. 2a-b.

†*Porocidaris schmidelii*, Kier (4) p. 844 pl. ciii fig. 3.

†*Porosoma vidali*, Bataller p. 31 pl. vi figs. 1, 1a, b; *P. lamberti*, Kier (4) p. 845 pl. ciii figs. 6-8.

*Pourtalesia laguncula beringiana*, Baranova pp. 231-232 fig. 17.

†*Pseudocidaris (Pseudocidaris) mammosa*, Kongiel pp. 60-61 pl. i figs. 4-6 pl. ii fig. 1.

†*Pseudopygurus ambroggi* *sp. nov.* Jurassic Morocco, Petitot (1) pp. 83-86 figs. 1, 2 pl. i figs. 1-7.

†*Pseudopyrina ovulum*, Chavan & Cailleux p. 201 fig. 2252.

†*Pygaster truncatus*, Chavan & Cailleux p. 198 fig. 2238.

†*Pygaster (Pygaster) cf. subtilis*, Kongiel p. 72 pl. vi figs. 1, 2.

*Pygasteroida* order nov. for family *Pygasteridae* Lambert, 1900, Durham & Melville (2) p. 253.

†*Pygurus (Pygurus) jurensis*, Kongiel p. 73 pl. vii figs. 1-3.

†*Pyrina pygaea*, Aliev pp. 1171-3 fig. 4.

†*Rhabdocidaris sp. cf. zitteli*, Eocene British Somaliland, Kier (4) p. 844 pl. ciii figs. 1, 2; *R. vidali*, Bataller p. 32 pl. vi figs. 2-4.

*Rotula deciesdigitata* and *orbiculus*, Tortonese (1) pp. 1-4.

*Rotulina*, Durham & Melville (2) p. 259, diagnosed.

†*Rhynobrissus cuneus sp. nov.* North Carolina, U.S., Cooke (2) pp. 10-12 pl. i.

†*Salenia geometrica*, Chavan & Cailleux p. 194 fig. 2226.

†*Schizaster (Schizaster)* pp. 880-881 with *S. africanus* pp. 881-882 pl. cv fig. 11 Kier (4); *S. (Paraster)* p. 882 with *S. (Paraster) duroensis* Paleocene British Somaliland pp. 885-886 pl. cvi figs. 11-14, *hunti* Paleocene British Somaliland pp. 882-883 pl. cvi figs. 5-7 *karkarensis* Eocene British Somaliland pp. 883-884 pl. cvi figs. 1-3 *spp. nov.*, *S. (P.) belouchistanensis* pp. 884-885 pl. cvi figs. 8-10, *S. (P.) sp. cf. meslei* p. 883 pl. cvi fig. 4, *Id*; *S. miyazakiensis sp. nov.* Miocene Japan, Morishita (1) pp. 197-199 pl. iii figs. 1a-d, 2a-d, pl. iv figs. 1a-d; *S. vidali*, Bataller p. 32 pl. vi figs. 5, 5a.

†*Scutella montagnai sp. nov.* Oligo-Miocene Italy, Mirigliano pp. 9-12 text-fig. 1 pl. i figs. 1, 2; *S. subrotunda*, Chavan & Cailleux p. 199 fig. 2247.

*Scutellina*, Durham & Melville (2) p. 259, diagnosed.

†*Sismondia polymorpha*, Cooke (1) pp. 362-363 pl. cxix figs. 9-13.

*Spatangoida*, Durham & Melville (2) p. 261, diagnosed.

†*Spatangoides striatoradiatus*, Chavan & Cailleux p. 204 fig. 2265.

*Sperosoma biseriatum*, Baranova p. 210.

†*Stomechinus bigranularis*, Chavan & Cailleux p. 195 fig. 2230a-c; *S. gyratus* pp. 68-69 pl. v figs. 2-4, *S. cf. semiplacenta* p. 69 pl. v fig. 1 pl. iv fig. 7, Kongiel.

*Strongylocentrotus djakonovi sp. nov.* pp. 223-225 fig. 14. *S. polyacanthus apicimagis subsp. nov.*, Bering Sea, Baranova, *S. droebachiensis* pp. 212-214 fig. 9, *echinoides* pp. 216-219 fig. 11, *polyacanthus* pp. 219-221 fig. 12, *pulchellus* pp. 211-212 fig. 8, *sachalinicus* pp. 214-216 fig. 10, *Id.*; *S. nudus*, Chang & Woo pp. 131-134 figs. 4-7 pl. i fig. 2 pl. ii fig. 2.

*Stylocidaris affinis*, Tortonese (3) p. 192.

†*Temnechinus turbinatus*, Engel in Burck p. 36 fig. 2.



Temnopleuroida, **Durham & Melville** (2) p. 255, diagnosed.

†*Tetragramma pomeraniae* sp. nov. Jurassic Pomerania, **Kongiel** pp. 65–67 pl. iv figs. 1–3.

†*Thylechinus vidali*, **Bataller** pp. 29–30 pl. v figs. 1, 2.

†*Toxaster retusus*, **Chavan & Cailleux** p. 206 fig. 2273.

†*Toxaster (Pliotoxaster) collegnei*, **Aliev** pp. 1173–1174 fig. 5.

†*Triplacidia vidali*, **Bataller** p. 33 pl. vii figs. 1, 1a, 1b.

†*Trochalosoma vidali*, **Bataller** p. 29 pl. iv figs. 10–13.

†*Trochotiara mamillanum*, **Kongiel** pp. 63–65 pl. iii figs. 4–7.

*Tromicosoma tenue*, **Baranova** pp. 210–211.

*Urechinus loveni* p. 231, *narcisianus* pp. 229–230, **Baranova**.

†*Vaquerosella coreyi* pp. 630–631 pl. lxxii fig. 11, *V.* sp. indet., Miocene Oregon, U.S., p. 630 pl. lxxii fig. 2, **Durham**.

## †SOMASTEROIDEA

[Vacant]

## ASTEROIDEA

*Acanthaster planci*, **Hayashi** (1) pp. 169–171.

*Aleutiaster schefferi*, **Baranova** p. 166.  
*Allostichaster capensis*, **Madsen** (1) p. 44.

*Anasterias antarctica* pp. 38–40 pl. v figs. 1, 2, *minuta* p. 40, *varium* pp. 40–42 pl. v figs. 3–9, **Madsen** (1).

*Anseropoda placenta*, **Zavodnik** pp. 121–122 fig.

*Anteliaster microgenys nannodes*, **Baranova** p. 176.

†*Archasterina* gen. nov. p. 111, family Palasterinidae, for type *A. cornuta* sp. nov. Devonian Germany, pp. 111–115 fig. 24 pl. xxxvi figs. 1–5, **Lehmann**.

†*Asteriacites lumbricalis*, **Jörg** pp. 34–35.

*Asterias microdiscus* p. 178, *rathbuni* p. 179, **Baranova**; *A. rubens*, **Gruner in Stresemann** p. 454 fig. 452; *A. forbesi*, **Guthrie & Anderson** p. 489 fig. 16.2; *A. rubens*, **Lehmann** pl. xlvii fig. 3.

*Asterias (Stolasterias) volsatella*, **Lehmann** pl. xxxii fig. 4.

*Asterina coronata* forma *japonica* nov. S. Japan; **Hayashi** (1) pp. 119–120 pl. xi figs. 5, 6, 7, pl. xiii fig. 7. *A. batheri* p. 119 pl. xiii figs. 5, 6, *exigua* p. 121, *pectinifera* pp. 121–122, **Id**; *A. stellifer*, **Collignon** pl. i fig. 2.

*Asterodon singularis*, **Madsen** (1) p. 20.

*Astrocles actinodetus*, **Baranova** p. 173.

*Astropecten marginatus*, **Bernasconi** (1) pp. 67–68 pl. ii figs. 3, 4; *A. michaelsoni*, **Collignon** pl. i fig. 1; *A. aurantiacus*, **Cumano** cover picture; *A. irregularis*, **Gruner in Stresemann** p. 454 fig. 454/1; *A. ludwigi*, referred to *Ctenopleura*, **Hayashi** (2) p. 42.

*Astrosole platei*, **Madsen** (1) p. 37.

†*Baliactis* p. 81, with *B. scutatus* pp. 85–86 pl. xxvi figs. 3–5, *tuberatus* pp. 83–84 pl. xxvi figs. 1, 2 spp. nov. Devonian Germany, **Lehmann**. *B. devonicus* pp. 81–83 fig. 22a pl. xxv figs. 1–3, *B.* sp. p. 86 pl. xxvii figs. 1–3, **Id**.

*Benthopecten claviger* pp. 158–159 *claviger occidentalis* p. 159, **Baranova**.

*Brisingella pannychia*, **Baranova** p. 173.

*Ceramaster arcticus*, *clarki* p. 162, *japonicus*, *patagonicus* p. 161, *stellatus* pp. 161–162, **Baranova**; *C. granularis*, **Blacker** pp. 18–21, 45 fig. 27a, b.

*Cladaster validus*, **Baranova** pp. 162–163.

*Coscinasterias tenuispina*, **Tortonese** (3) p. 191.

*Cosmasterias lurida*, **Madsen** (1) pp. 42–43 pl. vi figs. 1, 2.

*Crossaster borealis* p. 165, *papposus* p. 166, **Baranova**; *C. papposus* pp. 186–187, *papposus* forma *japonicus* p. 187, **Hayashi** (1).

*Ctenodiscus crispatus*, **Baranova** p. 153.

*Ctenopleura fisheri* sp. nov. Japan, **Hayashi** pp. 37–42 text-figs. 1, 2, pl. i figs. 1–3. *C. ludwigi* pp. 42–44 text-fig. 3 pl. i figs. 4, 5, **Id**.

*Cycethra verrucosa*, **Madsen** (1) p. 21.

*Diplopteraster multipes*, **Baranova** p. 167; *D. multipes*, **Hayashi** (1) pp. 199–200 pl. xii fig. 1, pl. xiii fig. 1.

*Dipsacaster anoplus* pp. 156–157, *borealis* p. 157, **Baranova**.

*Echinaster antonioensis*, **Bernasconi** (1) pp. 72–73 pl. vi figs. 1, 2; *E. luzonicus*, **Hayashi** (1) pp. 123–124; *E. sepositus*, **Tortonese** (3) p. 190.

†*Echinasterella* p. 115, with *E. sladeni* pp. 116–118 pls. xxxvii–xxxix, **Lehmann**.

†*Encrinaster schmidi*, **Grabert & Grabert** pp. 190–197 fig. 1 pls. xii, xiii.

*Enoplopatiria marginata*, **Bernasconi** (1) pp. 70–72 pl. iv fig. 4, pl. v fig. 2 pl. vii fig. 1.

†*Eostella* gen. nov. p. 146 (incertae sedis) for type *E. hunsrückiana* sp. nov. Devonian Germany pp. 146–147 fig. 30 pl. 1 figs. 4–6 **Lehmann**.

*Eremicaster pacificus* pp. 154–155, *tenebrarius* p. 154, **Baranova**.

*Evasterias echinosoma* p. 178, *retifera* pp. 177–178, *trochelii* p. 178, **Baranova**.

†*Forbesiaster gaensis* sp. nov. Cretaceous Egypt, **Jux** pp. 187–189 pl. xxi figs. 1, 2.

*Freyella hexactis* sp. nov. Bering Sea, **Baranova** pp. 174–175 fig. 1.

*Ganeria falklandica*, **Madsen** (1) p. 22.

*Gephyreaster swifti*, **Baranova** p. 159.

†*Helianthaster* pp. 89–91 with *H. rhenanus microdiscus* var. nov. Devonian Germany p. 93 pl. xxxi figs. 1, 2, *H. rhenanus* pp. 91–93 pl. xxx figs. 1–4, **Lehmann**.

*Henricia* pp. 125–128, with *H. exigua* pp. 138–140 figs. 19–21 pl. vii figs. 5, 6, *irregularis* pp. 164–166 figs. 60–63 pl. iv figs. 1, 2, *kinkasani* pp. 144–146 figs. 28–31 pl. vii figs. 7, 8, *pachyderma* pp. 160–162 figs. 53–55 pl. vii figs. 1, 2, *pacifica* figs. 40–43 pl. ix figs. 7–10, *regularis* pp. 137–138 figs. 15–18 pl. x figs. 3, 4, *reniessa* pp. 132–134 figs. 7–10 pl. viii figs. 16, 17, *reticulata* pp. 162–164 figs. 56–59, pl. ix figs. 1, 2, *saghalienensis* pp. 142–144 figs. 25–27 pl. vii figs. 3, 4, spp. nov., *H. ohshimai* forma *acutispina* pp. 158–160 figs. 50–52 pl. x figs. 5, 6, *reniessa* forma *tohukuensis* pp. 135–137 figs. 11–14 pl. vii figs. 11, 12 formae nov. Japan, **Hayashi** (1); *H. aspera* pp. 154–156 figs. 44–46 pl. vii figs. 9, 10, *densispina* pp. 140–142 figs. 22–24 pl. x figs. 7, 8, *leviuscula* pp. 128–130 figs. 1–3 pl. viii

figs. 14, 15, *leviuscula spiculifera* pp. 130–132 figs. 4–6 pl. ix figs. 3, 4, *nipponica* pp. 146–149 figs. 32–35 pl. viii figs. 1, 2, 3, 4, *ohshimai* pp. 156–158 figs. 47–49 pl. ix figs. 5, 6, *tumida* pp. 149–152 figs. 36–40, pl. viii figs. 5–13, **Id**; *H. arctica* p. 172, *aspera* pp. 171–172, *asthenactis* p. 173, *beringiana* p. 172, *derjugini* p. 172, *longispina aleutica* p. 172–173, *orientalis* p. 172, *spiculifera* p. 171, *tumida* pp. 170–171, **Baranova**; *H. sanguinolenta*, **Gruner in Stresemann** p. 454 fig. 454/2. *H. obesa* p. 30, *studerii* p. 31, **Madsen** (1).

*Heliaster canopus* p. 36, *helianthus* pp. 34–35, *polybrachius* p. 36, **Madsen** (1); *H. helianthus*, **Schneider** p. 75.

*Hippasteria colossa*, *spinosa*, **Baranova** p. 162; *H. phrygiana*, **Blacker** pp. 18–21, 45 fig. 27c.

†*Hunsrückaster* gen. nov. (incertae sedis) with *H. peregrinus* sp. nov. Devonian Germany pp. 141–144 figs. 27–29 pl. xlix figs. 1–4, **Lehmann**.

*Hymenaster koehleri* p. 170, *perissotus* p. 170, *quadrispinosus* pp. 169–170, **Baranova**; *H. pellucidus*, **Blacker** pp. 21–22, 46; *H. glaucus*, **Hayashi** (1) pp. 200–202 pl. xii fig. 3, pl. xiii figs. 2, 3; *H. pellucides*, **Lehmann** pl. xlvii fig. 4.

†*Hystriaster* gen. nov. p. 151 (incertae sedis) for type *H. horridus* sp. nov. Devonian Germany pp. 152–154 pls. lii–lv, **Lehmann**.

†*Jaekelaster* p. 135, with *J. petaliformis* pp. 135–137 pl. xlvii figs. 1, 2 pl. xlviii fig. 1, **Lehmann**.

†*Kyraster* gen. nov. p. 144 (incertae sedis) for type *K. inermis* sp. nov. Devonian Germany pp. 144–145 pl. 1 figs. 1–3, **Lehmann**.

*Labiaster radiousus*, **Madsen** (1) pp. 33–34 pl. iv fig. 1.

†*Leioactis* gen. nov. pp. 86–87, family Taeniactinidae, for type *L. hunsrückianus* sp. nov. Devonian Germany, p. 87 pl. xxvii figs. 4–6, **Lehmann**.

*Leptasterias alaskensis* p. 184, *alaskensis asiatica* pp. 184–185, *aleutica* p. 185, *arctica* pp. 179–180, *asteira* p. 186, *cantschatica* p. 185, *coei trunculenta* p. 184, *groenlandica* pp. 181–182, *hylodes* p. 180, *hylodes reticulata* p. 180–181, *leptodoma* p. 184, *ochotensis* p. 181, *polaris acervata* pp. 182–184, *squamu-*



*lata* p. 181, *stolacantha* p. 186, **Baranova**; *L. polaris*, **Tortonese** (2) pp. 1-5, pls. i, ii.

*Leptychaster anomalus* p. 156, *arcticus* f. *microplax* p. 155, *pacificus* pp. 155-156, *propinquus* p. 156, **Baranova**.

*Lethasterias nanimensis chelifera*, **Baranova** p. 177.

*Linckia guildingii*, **Bernasconi** (1) pp. 68-70 pl. v figs. 1, 3.

*Lophaster furcilliger varator*, **Baranova** p. 163; *L. furcifer*, **Blacker** pp. 21-22, 45-46 fig. 28; *L. stellans*, **Madsen** (1) pp. 31-32.

*Luidia magellanica*, **Madsen** (1) pp. 16-18 pl. i figs. 1, 2; *L. sarsi*, **Tortonese** (3) p. 190.

*Luidiaster dawsoni*, **Baranova** pp. 157-158.

*Marthasterias glacialis*, **Millott** (2) figs. 7, 8, 11.

*Mediaster trinidadensis* sp. nov. Trinidad Island, off Brazil, **Bernasconi** (2) pp. 33-34 fig.

†*Medusaster* p. 94 with *M. rhenanus* pp. 94-99 fig. 23 pl. xxxii figs. 1-10, **Lehmann**.

*Meyenaster gelatinosus*, **Madsen** (1) p. 36.

†*Metopaster parkinsoni*, **Chavan & Cailleux** p. 192 fig. 2218.

*Mithrodia clavigera*, **Hayashi** (1) pp. 171-173.

*Myxoderma sacculatum*, **Baranova** p. 175.

*Nearchaster pedicellaris, variabilis*, **Baranova** p. 158.

*Nectria ocellifera*, **Lehmann** pl. xlii figs. 4, 5.

*Odontaster mediterraneus*, **Gautier-Michaz** pp. 80-81; *O. penicillatus*, **Madsen** (1) pp. 19-20.

†*Palaeactis* gen. nov. pp. 87-88, family Taeniactinidae, for type *P. lanceolatus* sp. nov. Devonian Germany pp. 88-89 fig. 226 pl. xxviii figs. 1-4, **Lehmann**.

†*Palaeosolaster* pp. 118-119, with *P. gregoryi* pp. 120-121 pl. xl figs. 1, 2, **Lehmann**.

†*Palaeostella* pp. 121-123, with *P. solida* pp. 123-126 pl. xli figs. 1-4 pl. xlii figs. 1-5, **Lehmann**.

†*Palasterina* p. 100 with *P. marginata* pp. 108-109 pl. xxxiv figs. 4-6, *maucheri* pp. 107-108 pl. xxxiv figs. 1-3, *taenibrachiata* p. 109 pl. xxxv figs. 1-3 *tilmanni* pp. 104-106 pl. xxix fig. 2 pl. xxxiii figs. 1, 2, spp. nov. Devonian Germany, **Lehmann**. *P. follmanni* pp. 100-103 pl. xxiii figs. 3-5, **Id**.

†*Palasteriscus* p. 78, with *P. devonicus* pp. 78-80 pl. xxiv figs. 1, 2, **Lehmann**.

†*Paleaster* sp., **Ladd** p. 36 pl. iii fig. 1.

*Patiria chilensis* pp. 23-24 pl. iv figs. 2, 3, *obesa* p. 24 pl. iii figs. 1-5, **Madsen** (1).

*Patriella calcarata* p. 25, *fimbriata* p. 26, **Madsen** (1).

*Pedicellaster magister*, **Baranova** p. 176.

*Peribolaster biserialis*, **Baranova** pp. 166-167.

*Porania antarctica*, **Madsen** (1) pp. 27-28.

*Poraniopsis* p. 166 with *P. inflata* pp. 167-169 pl. iv figs. 9, 10, **Hayashi** (1); *P. echinaster*, **Madsen** (1) pp. 29-30 pl. ii figs. 1-4.

†*Promopalaeaster* p. 905 with *P. pricei* sp. nov. Ordovician Pennsylvania, U.S., pp. 905-906 pl. cviii figs. 3, 4, **Cramer**.

†*Protasteracanthion* emended, pp. 147-148, with *P. primus* pp. 148-151 fig. 31 pl. li figs. 1-4, **Lehmann**.

*Pseudarchaster dissonus* pp. 160-161, *parelii* pp. 159-160, **Baranova**; *P. parelii*, **Blacker** pp. 18-21, 45.

*Psilaster pectinatus*, **Baranova** p. 157

*Pteraster*, key to Japanese spp. pp. 188-189, *P. uragaensis* sp. nov. pp. 194-195 pl. xi. figs. 3, 4, *tesselatus glomus* subsp. nov. pp. 193-194 pl. xi figs. 1, 2, Japan, **Hayashi** (1); *P. japonicus* pp. 196-197, *jordani* pp. 195-196 pl. xi fig. 8, pl. xii fig. 2, *multioporus* pp. 190-191, *obscurus* pp. 198-199 pl. xii figs. 4-6, pl. xiii fig. 4, *obesus* pp. 189-190, *tesselatus* pp. 191-193, **Id**; *P. marsippus* p. 168, *militaris* p. 167, *obscurus* p. 169, *pulvillus* p. 168, *temnochiton* pp. 168-169, *tesselatus* p. 168, **Baranova**.

*Pycnopodia helianthoides*, **Baranova** pp. 176-177.

†*Recurvaster lorioli* sp. nov. Cretaceous Egypt, Jux pp. 189–190 fig. 1 pl. xxi fig. 3.

†*Schlüteraster* gen. nov. pp. 137–138, family Compsasteridae, for type *Astropecten schlüteri* Stuertzt, Lehmann. *S. schlüteri* pp. 138–141 fig. 26 pl. xlviii figs. 2, 3, Id.

*Solaster dawsoni* p. 164, *endeca* pp. 163–164, *hypothrissus* p. 165, *pexillatus* p. 164, *stimpsoni* p. 164, Baranova; *S. papposus*, Gruner in Stresemann p. 455 fig. 455/1; *Solaster* key to Japanese spp. pp. 174–175, with *S. borealis* pp. 183–184, *dawsoni* pp. 178–180, *dawsoni* var. *intermedius* pp. 180–181, *endeca* pp. 175–177, *paxillatus* pp. 181–182, *stimpsoni* pp. 177–178 *Uchidai* pp. 184–185, Hayashi (1).

*Stephanasterias albula*, Baranova p. 177.

*Stichaster striatus*, Madsen (1) pp. 37–38.

†*Trichasteropsis weissmanni*, Heller pp. 45–47 fig. 1.

†*Urasterella* pp. 127–128, with *U. verruculosa* sp. nov. Devonian Germany pp. 131–134 fig. 25 pl. xlv figs. 1–3 pl. xlv figs. 1–4, Lehmann. *U. asperula* pp. 128–131 pl. xlviii figs. 1–4 pl. xlv figs. 1–6, Id.

*Zoroaster actinocles*, *ophiurus*, Baranova p. 175.

## OPHIUROIDEA

*Acrocrida semisquamata*, Cherbonnier (3) p. 167; *A. brachiata*, Gruner in Stresemann p. 456 fig. 456/3.

*Amphiodia craterodonta* p. 197, *euryaspis* pp. 197–198, *periercta* p. 197, Baranova.

*Amphipholis squamata*, Balinsky pp. 10–11; *A. nudipora*, Cherbonnier (3) p. 167; *A. squamata*, Gruner in Stresemann p. 456 fig. 456/2.

*Amphioplus ailsaclarki* sp. nov., Sierra Leone, Cherbonnier (3) pp. 167–170 figs. 2, 3. *A. cincta*, Id. p. 167; *A. integer*, Balinsky p. 11; *A. macraspis*, Baranova pp. 196–197.

*Amphiura inhacensis* pp. 5–7 text-fig. 2 pl. iv figs. 13, 14, *kalki* pp. 3–5 text-fig. 1 pl. i figs. 1, 2 spp. nov. Portuguese E. Africa, Balinsky; *A. angularis* p. 5, Id.; *A. apicula* sp. nov.,

Mediterranean, Cherbonnier (1) pp. 200–204 figs. 1–3; *A. beringiana* pp. 199–200 fig. 3, *carchara*, *leptodoma*, *psilopora* p. 198, *sundevalli* pp. 198–199, Baranova; *A. sculpta*, Cherbonnier (3) p. 167.

*Amphylicus androphorus*, Balinsky p. 11.

*Anthophiura axiologa*, Baranova pp. 201–202 fig. 5.

*Asteronyx loveni*, Baranova p. 186.

*Astrochele laevis*, Baranova pp. 186–187.

*Astrocladus coniferus*, Baranova p. 187.

*Astrophilura chariplax*, Baranova pp. 200–201 fig. 4.

†*Bundenbachia* p. 43 with *B. beneckeii* pp. 43–46 fig. 12 pl. x figs. 1–5 pl. xi figs. 1–4, Lehmann.

†*Cheiropteraster* p. 35 with *C. giganteus* pp. 35–38 figs. 9, 10 pl. vii figs. 1, 2, Lehmann.

†*Encrinaster* pp. 28–29, with *E. laevidiscus* sp. nov. Devonian Germany, p. 31 pl. v figs. 3–5, *roemeri* pp. 29–31 figs. 5–8 pl. v figs. 1, 2, Lehmann.

†*Eospondylus* p. 57 with *E. primigenius compactus* var. nov. Devonian Germany pp. 60–61 pl. xvi figs. 1–3, *E. primigenius* pp. 57–60 fig. 16 pl. xv figs. 1–6, Lehmann.

†*Erinaceaster* gen. nov. family Pradesuridae, p. 20 for type *E. tenuispinosus* sp. nov. Devonian Germany pp. 20–21, pl. i figs. 1–4, Lehmann; *E. giganteus* sp. nov. Devonian Germany pp. 22–23 fig. 2 pl. ii fig. 1 pl. iii fig. 1, *spinosissimus* pp. 21–22 pl. iv figs. 2, 3, Id.

†*Euzonosoma* pp. 24–25 with *E. tischbeinianum* pp. 25–28 figs. 3, 4 pl. iv figs. 1, 4–6, Lehmann.

†*Furcaster* pp. 63–65, with *F. decheni* pp. 69–72 figs. 18, 20b pl. xix figs. 1–3 pl. xx figs. 1, 2, *palaeozoicus* pp. 65–69 figs. 17, 20a pl. xviii figs. 1–6, *zitteli* pp. 72–74 figs. 19, 20c pl. xxi figs. 1–2 pl. xxii figs. 1–3, Lehmann.

†*Geocoma elegans*, Chavan & Cailleux p. 192 fig. 2217.

*Gorgonocephalus caryi*, Baranova pp. 187–188; *G. arcticus* pp. 22–26, 46–47 fig. 29d, *caput-medusae* pp. 22–26, 46–47 fig. 29a, *eucnemis* pp. 22–26, 46–47 fig. 29c, *lamarcki* pp. 22–26, 46–47 fig. 29b, Blacker.



†*Hymenosoma* gen. nov. p. 31, family Euzonosomatidae, for type *H. opitzi* sp. nov. Devonian Germany pp. 32–33 pl. vi figs. 1, 2, Lehmann.

†*Kentrospondylus* gen. nov. p. 61, family Hallasteridae, for type *K. decadactylus* sp. nov. Devonian Germany, pp. 61–62 fig. 15 pl. xvii, Lehmann.

†*Loriolaster* p. 38 with *L. gracilis* sp. nov. Devonian Germany pp. 41–42 pl. ix figs. 3, 4, *L. mirabilis* pp. 39–41 fig. 11 pl. viii figs. 1–3 pl. ix figs. 1, 2, 5, Lehmann.

*Macrophiothrix mossambica* sp. nov. Portuguese E. Africa. Balinsky pp. 18–20 text-fig. 7 pl. iii figs. 11, 12. *M. aspidota* p. 18, *hirsuta* pp. 17–18, *longipeda* p. 17, Id.

†*Mastigophiura* gen. nov. pp. 49–50, family Protasteridae, for type *M. grandis* sp. nov. Devonian Germany pp. 50–52 fig. 14 pl. xiii figs. 1, 2, Lehmann.

†*Miospondylus* p. 53 with *M. rhenanus* pp. 54–57 pl. xiv figs. 3, 4, Lehmann.

*Ophiacantha adiaphora* p. 191, *O. (?) atopostoma* p. 190, *bathybia* p. 192, *bidentata* p. 191, *enneactis* pp. 192–193, *macrarthra* p. 190, *nutrix* p. 193 fig. 2, *trachophora* p. 191, *trachybatra* pp. 191–192, Baranova.

*Ophiacanthella aconotophora*, Baranova p. 194.

*Ophiactis delagoae* sp. nov. Portuguese E. Africa, Balinsky pp. 12–13 text-fig. 5 pl. ii figs. 7, 8; *O. carnea* pp. 11–12, *hemiteles* p. 13, *lymani*, *modesta* p. 14, *parva* p. 15, *savignyi* p. 14, Id; *O. lutkeni*, Cherbonnier (3) pp. 166–167.

*Ophiocentrus dilatatus*, Balinsky p. 7.

*Ophiocoma erinaceus* pp. 25–26, *insularia* p. 26, *parva* p. 27, *pica* p. 26, *scolopendrina* p. 25, *valenciae* p. 27, Balinsky.

*Ophiocomella clippertoni*, Hertlein & Emerson p. 6.

*Ophiocten sericeum*, Gautier-Michaz p. 81.

†*Ophioglypha graysonensis*, Ladd p. 36 pl. iii fig. 3.

*Ophiolepis cincta*, Balinsky p. 28; *O. affinis*, Cherbonnier (3) p. 170.

*Ophioleuce oxycraspedon*, Baranova pp. 208–209 fig. 7.

*Ophiolimna bairdi* p. 189, *papillata* pp. 188–189, Baranova.

*Ophiomastix notabilis* p. 27, *venosa* pp. 27–28, Balinsky.

*Ophionephthys africana* sp. nov. Portuguese E. Africa, Balinsky pp. 7–9 text-fig. 3 pl. i figs. 3, 4.

*Ophionereis australis, porrecta, vivipara*, Balinsky p. 24.

*Ophiopenia disacantha* p. 208, *tetracantha* pp. 207–208, *vicina* p. 208, Baranova.

*Ophiopezella decorata*, Balinsky p. 28.

*Ophiopholis aculeata*, Baranova pp. 195–196, Gruner in Stresemann p. 456 fig. 456/1, Guthrie & Anderson fig. 16.7.

*Ophiophragmus sacensis* sp. nov. Portuguese E. Africa, Balinsky pp. 9–10 text-fig. 4, pl. ii figs. 5, 6.

*Ophiophthalmus cataleimoidus* p. 190, *normani* p. 189, Baranova

*Ophiopleura borealis*, Blacker pp. 26, 47 fig. 30a.

*Ophiopteron atlanticum*, Cherbonnier (3) pp. 163–166 fig. 1.

*Ophioschiza monacantha*, Baranova p. 188.

*Ophiosemnotes brevispina, diaphora, pachybatra, paucispina* p. 195, *tylota* p. 194, Baranova.

*Ophiothela beauforti* pp. 22–24 pl. iv fig. 16, *dividua* p. 22, Balinsky.

*Ophiothrix echinotecta* sp. nov. Portuguese E. Africa, Balinsky pp. 16–17 text-fig. 6, pl. iii figs. 9, 10; *O. spiculata*, Baranova p. 188.

*Ophiotrichoides propinqua*, Balinsky pp. 21–22.

*Ophiura bathybia* pp. 205–206, *cryptolepis* p. 207, *flagellata* pp. 206–207, *irrorata* p. 207, *leptocenia* p. 205, *maculata* p. 204, *quadrispina* p. 206, *sarsi* p. 205, Baranova; *O. africana*, Cherbonnier (3) pp. 170–171; *O. affinis* p. 457 fig. 457/3, *albida* p. 457 fig. 457/2, *texturata* p. 457 figs. 455/2, 457/1, Gruner in Stresemann.

†*Ophiurina* pp. 74–75 with *O. lymani* pp. 75–77 fig. 21 pl. xxiii figs. 1–3, Lehmann.

†*Palaeophiomyza* pp. 46–47 with *P. grandis* pp. 47–49 fig. 13 pl. xii figs. 1–5, Lehmann.

†*Palaeophiura simplex*, Lehmann pp. 52–53 pl. xiv figs. 1, 2.

*Placophiothrix foveolata* p. 20 pl. iv fig. 15, *proteus*, *trilineata* p. 21, Balinsky.

*Stegophiura nodosa*, Baranova pp. 202–204 fig. 6.

†*Taeniaster* p. 906 with *T. spinosus* pp. 906–907 pl. cviii figs. 1, 2 (*T. maximus* Willard a synonym), Cramer.

### CRINOIDEA

†*Acanthocrinus rex*, Struve fig. 1.

†*Allagecrinus sculptus* sp. nov. Carboniferous New Mexico, Strimple & Koenig pp. 1229–1230 fig. 2<sub>1–12</sub>.

†*Amphipsalidocrinus*, Strimple & Koenig pp. 1239–1240.

*Antedon bifida* (Pennant) 1777 a senior subjective synonym of *Antedon gorgonia* Fréminville, 1811 and type species of *Antedon* Fréminville, 1811, Direction 73 p. 209; *A. rosaceus*, Guthrie & Anderson fig. 16.15A, B; *Antedon*, Struve fig. 14.

†*Apiocrinus parkinsoni*, Chavan & Cailleux p. 191 fig. 2214.

*Bathycrinus gracilis* Thomson 1872, placed on the Official List of Specific Names in Zoology, Direction 73 pp. 198, 208; *B. complanatus*, Baranova p. 153.

*Bathymetra brevicirra*, Baranova p. 153.

†*Botryocrinus* ? sp., Sieverts-Doreck (1) p. 66.

†*Bourgueticrinus* includes *Mesocrinus* Carpenter, 1881 and *Metapiocrinus* Jaekel, 1918, Rasmussen p. 554.

†*Camarocrinus mariannae* sp. nov., Silurian Kazakhstan, U.S.S.R., Yakovlev (4) p. 29 pl. i figs. 1, 2 (see also *Scyphocrinus*).

†*Cromyocrinus simplex*, Yakovlev (6) p. 12 figs. 3a, 6.

†*Crotalocrinites baschkiricus* sp. nov. Silurian or Devonian U.S.S.R., Yakovlev (3) p. 15 pl. i figs. 1, 2.

†*Ctenocrinus* sp. nov. Devonian Germany, Sieverts-Doreck (1) pp. 65–66.

†*Cupressocrinus crassus*, Chavan & Cailleux p. 189 fig. 2205; *Cupressocrinus*, Firtion pp. 163–164 fig. 9 pl. x figs. 19, 20; *C. abbreviatus*, Struve fig. 13.

†*Dactylocrinus* p. 55 with *D. oligoptilus* pp. 55–56 pl. x figs. 1, 2, Yakovlev (2).

†Decacrinidae fam. nov., Eltuisheva p. 220.

†*Decacrinus* gen. nov. p. 221, family Decacrinidae, for type *D. pennatus* sp. nov. Devonian Kazakhstan, U.S.S.R. pp. 221–222 fig. 1 pl. i figs. 1–4, Eltuisheva. *D. orientalis* sp. nov. Devonian Amur, U.S.S.R. pp. 222–223 fig. 2 pl. i figs. 5–7, Id.

†*Diamenocrinus* sp. cf. *opitzi*, Sieverts-Doreck pp. 63–65 figs. 1a–b.

†*Dichostreblocrinus pyriformis* sp. nov. Carboniferous New Mexico, U.S., Strimple & Koenig pp. 1243–1244 fig. 4<sub>10–15</sub>.

†*Encrinus liliiformis*, Chavan & Cailleux p. 190 fig. 2213; *E. granulosus*, Szörényi p. 130.

†*Eucalyptocrinus rosaceus*, Chavan & Cailleux p. 189 fig. 2207.

*Florometra asperima*, Baranova p. 152.

†*Glenotremites janeti* referable to *Orthogonocrinus* (Roveacrinidae), Rasmussen p. 555.

*Heliometra glacialis*, Blacker pp. 16–18, 45 fig. 26a.

*Holopus rangii* d'Orbigny 1837, placed on the Official List of Specific Names in Zoology, Direction 73 pp. 198, 208.

†*Indocrinus crassus* fig. 2r, *elegans* fig. 2d and *piszowi* fig. 2b, Yakovlev (6).

†*Isocrinus agassizii* and *carinatus*, Rasmussen pp. 553–554.

†*Isselocrinus* with type *I. insculptus*, Rasmussen p. 553.

†*Jimbacrinus bostocki*, Yakovlev (6) pp. 11–12 figs. 1a, 6.

†*Kallimorphocrinus* pp. 1230–1233 with *K. angulatus*. Carboniferous New Mexico, U.S. pp. 1233–1234 figs. 1c, 2<sub>13–28</sub>, *tintinabulum* p. 1235 figs. 1d, 2<sub>36–39</sub>, *weldenensis* pp. 1234–1235 fig. 2<sub>29–35</sub>, both Carboniferous Oklahoma, spp. nov. Strimple & Koenig; *K. pristinus* fig. 1a, *puteatus* fig. 1b, Id.

†*Kuzbassocrinus* gen. nov. p. 223, family Decacrinidae, for type *K. bystrowi* sp. nov. Devonian Kuzbass, U.S.S.R. pp. 223–224 fig. 3 pl. ii figs. 1–2a, Eltuisheva; *K. binidigitatus* Devonian Altai, U.S.S.R. pp. 224–225 fig. 4 pl. ii figs. 3–3B, *decemlobatus* Devonian Amur, U.S.S.R. pp. 225–226

fig. 5 pl. i figs. 8-9a, *paucicostatus* Devonian Pribalkhash, U.S.S.R. pp. 226-227 fig. 6 pl. ii figs 4-5a spp. nov., **Id.**

†*Lampadosocrinus* gen. nov. pp. 1244-1245, family Codiocrinidae, for type *Dichostreblocrinus minutus* Peck, 1936, *L. obtusus* sp. nov. Carboniferous New Mexico, U.S. pp. 1245-1246 fig. 4<sub>16-18</sub>, **Strimple & Koenig**; *L. minutus* p. 1245 fig. 4<sub>19-21</sub>, **Id.**

†*Laudonocrinus* sp. undet., **Strimple** p. 369 fig. 1.

†*Lipocrinus* a synonym of *Isselocrinus*, **Rasmussen** p. 553.

†*Marsupites testudinarius*, **Struve** fig. 3.

†*Mesocrinus* Carpenter, 1881 a synonym of *Bourgueticrinus*, **Rasmussen** p. 554.

*Metacrinus wyvillii* Carpenter 1884, placed on the Official List of Specific Names in Zoology, **Direction 73** pp. 198, 208.

†*Metapiocrinus* Jaekel, 1918 a synonym of *Bourgueticrinus*, **Rasmussen** p. 554.

†*Millericrinus horridus*, **Chavan & Cailleux** p. 191 fig. 2215.

†*Ottowacrinus typus*, **Sieverts-Doreck** (2) figs. 3-4.

†*Pageocrinus* p. 56 with *P. heckeri* p. 56 pl. x fig. 3, **Yakovlev** (2).

†*Parabotryocrinus tschudowensis*, **Yakovlev** (2) p. 57 pl. x fig. 4.

†*Parapernerocrinus* gen. nov. p. 17 family Crotalocrinidae, for type *P. sibiricus* sp. nov. Devonian Siberia, U.S.S.R. pp. 16-18 pl. i figs. 4-8 pl. ii figs. 1, 2, **Yakovlev** (3).

†*Passalocrinus triangularis*, **Strimple & Koenig** p. 1246 fig. 4<sub>22-27</sub>.

†*Pentacrinus tuberculatus*, **Chavan & Cailleux** p. 191 fig. 2216; *P. crassus* Nielsen, 1913 invalidated by *P. crassus* Desor, 1845 but referable to *Isselocrinus* Rovereto, **Rasmussen** p. 553.

†*Plussacrinus* gen. nov. family Decacrinidae, for type *P. flabellum* sp. nov. Ordovician Leningrad Province, Estonia, U.S.S.R. pp. 228-229 fig. 8 pl. iii figs. 2-2B, **Eltuishcheva**; *P. dentatus* sp. nov. Ordovician Leningrad Province pp. 229-230 fig. 9 pl. iii figs. 3-3B, **Id.**

†*Podoliocrinus* gen. nov. p. 227, family Decacrinidae, for type *P. niki-forovae* sp. nov. Silurian Podolia, U.S.S.R. pp. 227-228 fig. 7 pl. iii figs. 1-1B, **Eltuishcheva**.

*Poliometra proluxa*, **Blacker** pp. 16-18, 45 fig. 26b.

†*Protocrinites yakovlevi* sp. nov. Ordovician Leningrad Province & Estonia, **Ghekker & Ghekker** pp. 274-278 figs. 1-4.

*Psathyrometra fragilis*, **Baranova** p. 152.

†*Pseudosaccocoma strambergensis*, **Patrulus** pp. 187-191 figs. 1-5.

*Retiometra alascana*, **Baranova** p. 152.

†*Rhipidocrinus* (*Rhodocrinus*), **Firtion** pp. 164-166 figs. 10, 11 pl. x figs. 21, 22.

*Rhizocrinus lofotensis*, correction of entry in Official List from M. Sars 1865 to M. Sars 1868, **Direction 72** pp. 166, 170, 171, 176, 177; **Direction 73** pp. 198, 208.

†*Ristnacrinus*, **Yakovlev** (5) pp. 155-157 figs. 1, 2.

*Saccocoma tenella*, **Struve** fig. 4.

†*Salagastiana simetrica*, **Sieverts-Doreck** (2) pp. 152-153 figs. 1-2.

†*Scyphocrinus mariannae* sp. nov. Silurian Kazakhstan, U.S.S.R., **Yakovlev** (4) p. 29 pl. iii figs. 1-5.

†*Sphaerometra* Gislén, 1924 possibly identical with *Glenotremites* Goldfuss 1931, **Rasmussen** p. 554.

†*Syndetocrinus uralicus* sp. nov. Silurian U.S.S.R., **Yakovlev** (3) p. 18 pl. ii figs. 3-5; *S.* sp. pl. ii fig. 6. **Id.**

*Thalassometra villosa*, **Baranova** p. 153.

†*Trophocrinus* pp. 1235-1237 with *T. bicornis* p. 1238 fig. 3<sub>5-12</sub>, *brevis* pp. 1238-1239 fig. 3<sub>13-16</sub>, *variabilis* pp. 1237-1238 fig. 3<sub>1-4</sub> spp. nov. Carboniferous Oklahoma, U.S., **Strimple & Koenig**.

*Tropiometra carinata*, **Tommasi** p. 37 figs. 26, 27.

†*Tythocrinus* pp. 1240-1241 with *T. alamogordoensis* sp. nov. Carboniferous New Mexico, U.S. pp. 1241-1243 fig. 4<sub>1-9</sub>, **Strimple & Koenig**.

†*Ureocrinus bockschii*, **Yakovlev** (6) p. 12 figs. 2a, 6.



†*Uintacrinus socialis*, Chavan & Cailleux p. 190 fig. 2212, Ladd p. 52 pl. ix fig. 1, Miller, Sternberg & Walker pp. 163–166 fig. 1, Struve p. 363 figs. 5, 6, 8, 10, 11, 12.

### †MACHAERIDIA

[Vacant.]

### †EOCRINOIDEA

*Mimocystites bohemicus*, Choubert & Termier pp. 138–142 figs. 1–7.

### †PARACRINOIDEA

[Vacant.]

### †CYSTOIDEA

*Echinospaerites aurantium*, Chavan & Cailleux p. 187 fig. 2200, Vokes (1) pl. i figs., 9, 10.

"*Eocystites*" sp. indet., Vermont, U.S., Shaw p. 788 pl. xcvi fig. 20.

*Pleurocystites*, Guthrie & Anderson fig. 161A.

*Pseudocrinites gordonii*, Vokes (1) pl. iv figs. 10, 11.

### †CARPOIDEA

*Paranacystis petrii*, Caster & Eaton pp. 611–614 figs. 1, 2B, C.

### †EDRIOASTEROIDEA

[Vacant.]

### †BLASTOIDEA

*Blastoidocrinus*, Guthrie & Anderson fig. 161B.

*Cryptoblastus submelo* sp. nov. Carboniferous Kazakhstan, U.S.S.R., Yakovlev (1) p. 72 pl. x fig. 5.

*Nymphaeoblastus kasakhstanensis* sp. nov. Carboniferous Kazakhstan, U.S.S.R. Yakovlev (1) p. 71 fig. 5 pl. x fig. 3; *N. anossofi* p. 71 pl. x fig. 1, *miljkovi* p. 71 pl. x fig. 2, Id.

*Orbitremites corallridgensis* pp. 137–139 fig. 1A pl. xiv figs. 8–11, *Kentuckyensis* pp. 135–137 figs. 1B, 1C, 1E pl. xiii figs. 1–20 spp. nov. Carboniferous Kentucky, U.S. Conkin; *O. oppelti* emended, pp. 139–140 fig. 1D pl. xiv figs. 1–7, Id.

*Pentremites* pp. 1–104 with *P. gutschicki* p. 68 pl. vii figs. 2, 3 pl. xii figs. 13–21, *halli* pp. 71–72 pl. ix figs. 2–7 pl. xiii figs. 4, 5 both Carboniferous Kentucky, U.S., *malotti* p. 48 pl. iii figs. 9, 10 Carboniferous Indiana, U.S. spp. nov., Galloway & Kaska; *P. abruptus* pp. 54–55 pl. iv figs. 9–11, *altus* p. 55 pl. iv figs. 19, 20, *angularis* p. 64 pl. v figs. 25–27, *basilaris* p. 74 pl. x figs. 9, 10, *biconvexus* pp. 47–48 pl. iii figs. 5–8, *bradleyi* p. 74 pl. x fig. 11, *broadheadi* p. 71 pl. ix fig. 1, *burlingtonensis* p. 42 pl. ii fig. 4, *buttsi* p. 58 pl. v figs. 7–9, *cervinus* p. 66 pl. vi figs. 9, 10, *cherokeus* p. 72 pl. ix figs. 8, 9, *chesterensis* pp. 69–70 pl. viii fig. 1, *claratus* p. 60 pl. v figs. 19–21, *conoideus* pp. 42–43 pl. ii figs. 8–15 pl. xi figs. 1–19 pl. xiii figs. 8, *conoideus amplus* p. 44 pl. ii figs. 21–26, *conoideus obtusus* pp. 43–44 pl. ii figs. 19, 20, *conoideus perlongus* p. 43 pl. ii figs. 16–18, *decussatus* pp. 41–42 pl. ii figs. 2, 3, *elegans* pp. 64–65 pl. v figs. 28–30 pl. vi figs. 1–4, *elongatus* p. 42 pl. ii figs. 5–7, *fohsei* p. 66 pl. vi figs. 11–13 pl. xiii fig. 6, *gemmiformis* p. 58 pl. v figs. 5, 6, *girtyi* pp. 59–60 pl. i fig. 8 pl. v figs. 15, 16 pl. xi figs. 31–42, *globosus* pp. 74–75 *godoni* pp. 48–49 pl. iii figs. 11–13 pl. xi figs. 20–30 pl. xiii figs. 9–12, *godoni abbreviatus* p. 49 pl. iii figs. 14–17, *godoni angustus* p. 50 pl. iii figs. 23, 24 pl. xiii fig. 1, *godoni major* pp. 49–50 pl. iii figs. 20–22, *godoni pinguis* p. 45 pl. iii figs. 1, 2, *grandis* p. 75, *hambachi* pp. 65–66 pl. vi figs. 7, 8, *hemisphericus* p. 68 pl. vii figs. 4, 5, *kali* pp. 58–59 pl. v figs. 10–12, *laminatus* pp. 67–68 pl. vii fig. 1, *maccalliei* p. 70 pl. viii figs. 2, 3, *nodosus* p. 65 pl. vi figs. 5, 6, *obesus* pp. 70–71 pl. viii figs. 4–6, *okavensis* p. 60 pl. v figs. 17, 18 pl. xi figs. 43–54, *ovalis* pp. 44–45 pl. ii fig. 29, *ovooides* p. 44 pl. ii figs. 27, 28, *patei* p. 57 pl. v figs. 1, 2, *perelongatus* p. 75, *platybasis* pp. 50–51 pl. iii figs. 25–29, *princetonensis* pp. 52–54 pl. iv figs. 5–8, *pulchellus* pp. 51–52 pl. iv figs. 1–4, *pyramidatus* p. 57 pl. v figs. 3, 4 pl. xiii fig. 7, *pyriformis* pp.

56-57 pl. iv figs. 32-37, pl. xiii figs. 2, 3, *robustus* pp. 66-67 pl. vi figs. 14, 15, *rusticus* p. 50 pl. iii figs. 18, 19, *serratus* pp. 73-74 pl. x figs. 7, 8, *speciosus* p. 59 pl. v fig. 14, *spicatus* pp. 72-73 pl. ix figs. 10, 11 pl. x figs. 1-4, *spicatus porrectus* p. 73 pl. x figs. 5, 6, *spinosus* p. 69 pl. vii fig. 8, *springeri* pp. 62-64 pl. v figs. 22-24, *sulcatus* pp. 68-69 pl. vii figs. 6, 7 pl. xii figs. 1-12, *symmetricus* p. 55 pl. iv figs. 12-18, *tulipaformis* p. 67 pl. vi figs. 16, 17, *turbinatus* p. 59 pl. v fig. 13, *tuscumbiae* pp. 46-47

pl. iii figs. 3, 4, *welleri* p. 56 pl. iv figs. 21-31, **Id**; *P. florealis*, **Chavan & Cailleux** p. 188 fig. 2204; probable priority of *P. altimarginatus* T. H. Clark over *biconvexus* Ulrich and of *divergens* Clark over *princetonensis* Ulrich, **Sinclair** p. 982.

*Pentremitidea leda*, **Galloway & Kaska** pp. 40-41 pl. ii fig. 1.

*Schizoblastus librovitchi* **sp. nov.** Carboniferous Urals, U.S.S.R., **Yakovlev** (1) pp. 71-72 pl. x fig. 4.

